Can You Imagine . . .

. . . 3-D imaging equipment that makes delicate surgery safer and helps train new doctors.

REAL IMAGES OFFER REAL BENEFITS TO MEDICINE

Performing surgery through the eye of a lens, whether endoscopically or microscopically, takes time and training to perfect. As difficult as hand-eye coordination is in procedures like laparoscopic abdominal surgery and microvessel suturing, adding cameras and specialized tools makes it even more complicated. Surgical tools that function as naturally as possible can minimize the impact these tools have on hand-eye coordination.

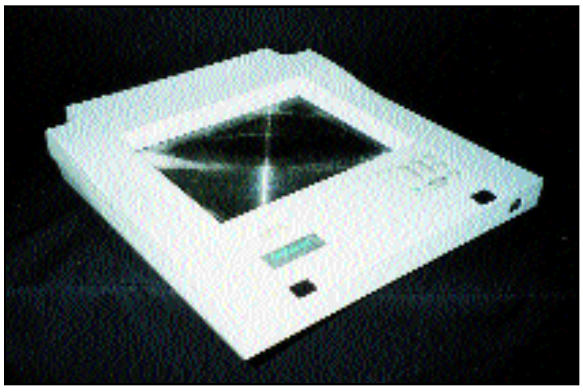
To this end, VRex, Inc., a marketing arm of Reveo, Inc. (Hawthorne, NY), now offers real-time 3-D imaging equipment for medical education and surgeries. The company's µPol™ system works with microscopes and endoscopes to give physicians an accurate 3-D view of the surgical field. The surgeon looks through normal eyepieces, manipulates tools, and performs procedures, while observers use passive glasses to view the procedure on an output display. Students at remote sites could also view the operation on a display.

VREX DEMONSTRATED STEREO ENDOSCOPY WITH THE µPOL™ SYSTEM AT NUMEROUS MEDICAL CONVENTIONS.

In demonstrations of stereo endoscopy with the VRex system at numerous medical conventions, surgeons acknowledged the advantages of the 3-D capability. It restores depth perception, reduces operating time, and allows surgical execution to a precise depth. These advantages are crucial in such procedures as nasal sinus endoscopy, which poses a risk of damage to the brain, optic nerve, and carotid arteries.

The company's award-winning 3-D stereoscopic notebook computer—CyberBook™—also uses the µPol system. Along with CyberBook, VRex introduced a Microsoft Windows™ and Apple Macintosh™ compatible SMUX™ software program. SMUX enables users to create 3-D stereoscopic images and display them on the CyberBook. CyberBook sells for as little as $3,500 and SMUX costs between $300 and $400.

Other 3-D stereoscopic products include the VR-1000™ and CAM-3000™. VR-1000, a compact liquid crystal display projection panel, displays flickerless video and computer graphics on large screens from a conventional overhead projector; CAM-3000 is a compact 3-D stereoscopic video camera.



■ Reveo has recently introduced the world's first 3-D stereoscopic overhead projection system, pictured above, which uses polarization encoding to project two digital images simultaneously.

Reveo received BMDO SBIR contracts to build a stereo printer, display, and camera for viewing missiles, decoys, and other battlefield situations in 3-D. The company developed micropolarized viewing hardware, a polarization encoding system, and spatial multiplexing methods to enhance its displays.

ABOUT THE TECHNOLOGY

The system's µPol array uses polarization encoding to project two digital images simultaneously. The system uses spatially multiplexed imaging (SMI) to arrange the left and right images of a stereo pair by position in space instead of by time. It transforms incoming unpolarized light into two perpendicular polarized states, each of which passes one of the stereo pairs of images. Passive polarized glasses decode the polarized (or encoded) images, passing the appropriate image from the stereo pair to the appropriate eye. Processing the images spatially eliminates flicker, so SMI can be used for video and television. In addition to producing 3-D images for all VRex display devices, SMI can generate 3-D transparencies.